Nick Brook

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Senior connected-product engineer with 14+ years shipping end-to-end embedded, mobile, and cloud systems for international clients. Deep experience in Bluetooth and cellular IoT firmware, iOS and macOS apps, and AWS-hosted backends, with a focus on secure boot, OTA update systems, and long-lifecycle field reliability. Picks up new platforms and toolchains quickly, and uses AI-assisted development as practical engineering leverage.

RELEVANT EXPERIENCE

Director, Connected Product Engineer (Firmware, Mobile, Cloud) January 2014–Present (12 y)

NRB Tech Ltd

- Architect and ship end-to-end connected products spanning embedded firmware, iOS/macOS/Android apps, and cloud infrastructure for 10+ international clients across North America, Europe, and Asia
- Take technical ownership of architecture, security, and lifecycle — secure boot, OTA with rollback, manufacturing provisioning, and multi-year firmware maintenance
- Lead small teams of up to 3 subcontractors and collaborate with larger client teams to deliver to fixed deadlines and budgets
- AirTurn — Bluetooth pedals, remotes, apps, and developer SDK for music and accessibility (10+ year engagement)
  - Migrated long-running firmware to a modern, field-updatable platform on nRF Connect SDK / Zephyr RTOS, with signed OTA and automatic rollback across 6+ device models
  - Designed and built iOS, macOS, and Android apps providing firmware updates, complex macro programming, analogue calibration, and shareable configuration profiles
  - Delivered third-party iOS/Android SDK adopted by major music apps including forScore and OnSong, providing seamless device discovery and event handling
- KēZ — LTE-M vehicle security platform: end-to-end firmware, iOS app, and AWS backend
  - Engineered embedded device with cellular and BLE coexistence, voltage-aware power states, and modem watchdogs for 24/7 monitoring at minimal vehicle-battery draw
  - Designed enterprise-grade security architecture using PKI with ECDSA, ECDH, and AES-GCM-256; built shared C cryptography library with comprehensive unit tests, deployed across firmware, mobile, and server
  - Built modern iOS app in Swift / SwiftUI / CoreBluetooth using async/await, Actors, and Combine; live BLE diagnostics streamed to the companion app for field service
  - Delivered cloud backend on AWS (EC2, S3, CodeDeploy) running Ubuntu with Node.js / TypeScript, PostgreSQL, Mosquitto MQTT, and Redis, with CI/CD release pipelines
- Positive Grid — Bluetooth and USB MIDI foot controllers for guitar amplifiers
  - Migrated firmware platform to the latest nRF Connect SDK / Zephyr; implemented class-compliant USB MIDI on a memory-constrained nRF52840
  - Built BLE and USB DFU update paths with secure signing and rollback, in a single update package supporting multiple hardware revisions
  - Established a hermetic, reproducible release pipeline with formal SDK-patch management over the vendor SDK
- ROUTES (Second Nature Studio) — Distributed, sensor-driven public light installation
  - Designed distributed control across many Raspberry Pi panels, with real-time MQTT messaging for synchronised animations and pedestrian motion sensing (speed and direction)
  - Built and operated a remote-managed Pi fleet over Tailscale (NAT-traversing mesh VPN) with cellular and local Wi-Fi failover, security-hardened OS configuration, and a real-time monitoring dashboard
- Active contributor to open source projects including Zephyr RTOS and RxAndroidBle, focused on Bluetooth Low Energy and embedded systems

Head of Development January 2012–April 2014 (2y)

Akkroo Ltd, London, UK

- Led development of the Akkroo event data capture platform (later acquired by Integrate), serving Fortune 500 clients including Adidas, Morgan Stanley, IBM, and Cisco at major trade shows and events
- Architected an offline-first mobile application and web platform, enabling reliable data collection in challenging network environments with automatic synchronisation
- Built scalable REST API and database architecture supporting high-volume concurrent capture, processing thousands of leads per event

- Recruited and managed a team of 3 engineers, establishing coding standards, review processes, and deployment practices

EDUCATION AND TRAINING

(ISC)² Certified Secure Software Lifecycle Professional (CSSLP) March 2021
Learning Tree International **Certified**

MEng Electronic Engineering July 2011
Durham University, Durham, UK **First Class Honours**

- **Relevant Coursework:** Control Systems, Digital Signal Processing, Electronics and Communications, Embedded Systems Design, Software Engineering, Communications Systems

TECHNICAL SKILLS

- **Operating Systems:** macOS, iOS, Android, Linux (Ubuntu, CentOS, Yocto/Buildroot familiarity), Windows
- **Programming Languages:**
  - **Expert:** C, Swift, Python, JavaScript/TypeScript
  - **Proficient:** C++, Java, Objective-C, SQL, Bash, HTML/CSS
  - **Familiar:** Kotlin, MATLAB, LaTeX
- **Frameworks & Libraries:**
  - **Mobile:** SwiftUI, UIKit, CoreBluetooth, AccessorySetupKit, Combine, async/await, Actors, Android SDK, React Native
  - **Embedded:** Zephyr RTOS / nRF Connect SDK, Nordic nRF5 SDK, ESP-IDF, MCUboot
  - **Backend & Web:** Node.js, Express, REST APIs, WebSockets, MQTT (Mosquitto), Protocol Buffers
- **Tools & Technologies:**
  - **Connectivity:** Bluetooth Low Energy, LTE-M, NB-IoT, Wi-Fi, USB MIDI, USB DFU, Tailscale, Quectel BG77
  - **Cloud & DevOps:** AWS (EC2, S3, CodeDeploy, Lambda), Docker, CI/CD, Mosquitto, Nginx, Apache
  - **Databases:** PostgreSQL, MySQL, MongoDB, Redis, Realm
  - **Security:** PKI, ECDSA, ECDH, AES-GCM, TLS, secure boot, signed firmware, OTA with rollback
  - **Development:** Xcode, Android Studio, CLion, VS Code/Cursor, Git, Docker, generative-AI tooling for engineering

CORE COMPETENCIES

- **Technical Architecture:** End-to-end system design across embedded firmware, mobile applications, and cloud infrastructure
- **Security Engineering:** Practical cryptography, PKI, secure boot, signed OTA with rollback, and secure communication across firmware, mobile, and cloud
- **Lifecycle & Reliability:** Designing for OTA updates, field diagnostics, manufacturing provisioning, and multi-year maintainability
- **Team Leadership:** Recruiting, mentoring, and managing small engineering teams; setting coding standards, review processes, and release practices

INTERESTS

- Sustainability and energy efficiency — particular interest in connected-product applications for home energy and decarbonisation
- Running, cycling, and swimming
- Plant-based cooking and baking
- Open source contribution and community engagement

REFERENCES

Available on request